REMARKS/ARGUMENTS

This amendment is responsive to the Office Action mailed 5/1/2007 (hereinafter, "5-1-07 OA") wherein claim 5 was rejected under 35 USC §102 (e) as being anticipated by Harding, et al. (US 6,678,057 B2); claims 1-4, 6-8, 11, and 12 were rejected under USC §103 (a) on Harding, et al. in view of Crampton (US 2003/0231793 A1); claims 9 and 10 were rejected under USC §103 (a) on Harding, et al. in view of Crampton and further in view of Vlahos, et al. (US 6,538,396 B1); and Claim 13 was rejected under USC §103 (a) on Harding, et al. in view of Crampton and further in view of Tu, et al. (US 6,876,459 B2).

Claims 1-13 remain pending in this application. Reconsideration in light of the following remarks is respectfully requested.

The rejection of Claim 5 under 35 USC §102 (e) on Harding, et al. is respectfully traversed. The present invention, as claimed in Claim 5 is patentable over the Harding reference. "Anticipation requires the disclosure in a single prior art reference of each element of the claim under consideration." W.L. Gore & Associates v. Garlock, Inc., 220 USPQ 303, 313 (Fed. Cir. 1983).

The Harding reference does not disclose each element of the present invention as claimed in claim 5. Specifically, the present invention claims "...providing data representative of a known reference model of said object" ***Applicants' Application, Claim 5***. The Harding reference does not teach or suggest providing data representative of a known reference model. The Harding reference instead teaches, "Apparatus 10 is adapted to inspect and determine surfaces of the object. These surfaces may include features such as tilts, bends, twists, or warps when compared to a reference model..." ***Harding, Col. 2, Ln. 63-67.*** Harding does not teach that a reference model is an integral part of the invention disclosed therein. Therefore, the present invention, as claimed in Claim 5 is not anticipated by the Harding reference. Claim 6 depends directly from claims 5. Accordingly, Applicants submit that claim 6 is allowable by dependency.

Therefore, as stated above, the present invention, as claimed in Claims 5 and 6 is patentable over the Harding reference. Thus, it is respectfully requested that the rejection of Claim 5 under 35 USC §102 be withdrawn.

Applicants respectfully traverse the rejection of claims 1-4 and 6-13 under 35 USC 103(a).

In the 5-1-07 OA, the Examiner stated, "Regarding Claim 1, Harding discloses a non-contact measurement system for providing gauge measurement of an object, comprising: at least one light source to illuminate said object with structured light (column 4, lines 6-12):" ***5-1-07 OA, pg. 2, § 2.***

The portion of Harding cited by the Examiner relates to polarized light and the selection of a polarization angle:

> **As shown in FIG. 3, the polarization of any light which has bounced off of two or more surfaces of object 12 is changed so as to be different from directly reflected light. By selecting polarization angle θ for the light illuminating the surface of object 12 and subsequent filtering of the light as seen by the imaging sensors 24, single bounce and double bounce light is effectively separated.**

Harding, Col. 4, Ln. 6-12. It is unclear as to what the Examiner intended, as the above-cited portion of Harding does not disclose a measurement system of any sort, but instead discloses the selection of a polarization angle for light.

In contrast to the polarized light disclosed in the section of the Harding reference cited by the Examiner, the present invention includes an imaging device: "Imaging device 20 is preferably a full-field, non-contact, laser range sensor mounted on a translation stage." ***Applicants' Application, ¶0024.***

With regard to Claim 1, in the 5-1-07 OA, the Examiner further stated, "Regarding Claim 1, Harding discloses… an image register configured to store information corresponding to a reference model of said object and at least one image of said object (column 4, lines 50-54)" ***5-1-07 OA, pg. 3.***

The portion of Harding cited by the Examiner does disclose that, "…using known information of multiple images, an image of a object undergoing measurement may be correlated or registered to a stored reference image…" ***Harding, Col. 4, Ln. 50-52.***

However, Harding does not teach, disclose, or suggest providing an image register as an integral part of a non-contact measurement method, as does the present invention.

In rejecting Claim 1 of Applicants' Application, the Examiner further stated in the 5-1-07 OA, "Regarding Claim 1, Harding discloses... a gauge measurement module configured to receive said registered image of said object and to identify gauge measurements from said registered image of said object (column 2, lines 1-8)." ***5-1-07 OA, pg. 3.***

It is unclear as to what the Examiner intended, as Column 2, Lines 1-8 of Harding discloses:

> ...a diffusing material such as a paint or a powder to non-contact gauge measurement. This additional step adds uncertainty to the measurement, and increase measurement time which is highly undesirable. Accordingly, there is a need for elimination or reducing the effect of undesired reflections from shiny or prismatic object surfaces in a non-contact measurement system in a manner which does not require application of diffuse coatings to surfaces of the object being tested.

Harding, Col. 2, Ln. 1-8. The above-cited portion of Harding cited by the Examiner is clearly not directed to a gauge measurement module, as asserted by the Examiner in the 5-1-07 OA. In fact, Harding does not disclose a gauging module at any point therein.

Unlike the Harding reference, Claim 1 of the present invention is directed to a, "A non-contact measurement system for providing gauge measurements of an object, comprising:... a gauge measurement module configured to receive said registered image of said object and to identify gauge measurements from said registered image of said object." ***Applicants' Application, Claim 1.***

As noted by the Examiner on page 3 of the 5-1-07 OA, "Harding is silent about the specific details regarding the step of: a transformation estimator couple to said image register and adapted to register said at least one image of said object to said object reference model."

The Examiner then stated, "In the same field of endeavor, however, Crampton discloses scanning apparatus and method comprising the step of: a transformation estimator coupled to said image register and adapted to register at least one image of said object to said object

reference model [page 8, paragraph (0013)]. ***5-1-07 OA, Pg. 3.***

The section of Crampton cited by the Examiner does not disclose a transformation estimator. Instead, ¶[0113] of Crampton discloses a "transformation matrix…calculated from the known geometry of the reference plate" ***Crampton, ¶[0113].***

In contrast to the transformation matrix disclosed in Crampton, the Applicants' application discloses, "A transformation estimator 26 includes a processor to which is supplied data representing the determined patches from image register 24." ***Applicants' Application, ¶[0036].***

Returning now to the Examiner's assertion that, "In the same field of endeavor, however, Crampton discloses scanning apparatus and method comprising the step of: a transformation estimator coupled to said image register and adapted to register at least one image of said object to said object reference model [page 8, paragraph (0013)]. ***5-1-07 OA, Pg. 3.,*** with regards to the "same field of endeavor" the MPEP states,

> "In order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned." In re *Oetiker*, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992).

MPEP 2141.01(a) *(emphasis added).* The Applicants respectfully submit that the Harding reference is not in the same field of endeavor as either the present invention or the Crampton reference. The present invention has been placed in US Class 382/106, entitled "*Image Analysis/Range or distance measuring*". The Harding reference is classified as belonging to US Class 356/603, which is entitled, *"Optics: Measuring and testing/Projection of structured light pattern".* The Crampton reference is classified as belonging to US Class 382/154, entitled, "*Image analysis/3-D or stereo imaging analysis*".

Therefore, the Applicants respectfully disagree with the assertion of the Examiner that, "It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a transformation estimator as taught by Crampton in the system of Harding…"

With regards to the rejection of Claim 2, the Examiner stated:

Regarding Claim 2, Harding is silent about the specific details regarding the non-contact measurement system of claim 1 wherein said image registered is configured to store one or more sets of patches associated with said object reference model and one or more sets of patches associated with said at least one image of said object.

5-1-07 OA, Pg. 3-4. The Examiner then asserted that,

In the same field of endeavor, however, Crampton discloses scanning apparatus and method comprises image register is configured to store one or more sets of patches associated with said object reference model and one or more sets of patches associated with said at least one image of said object [pages 8-10, paragraph (0136)]

5-1-07 OA, Pg. 4. The Applicants again respectfully submit that the Crampton and Harding references are classified in different US classes, and are therefore not in the same field of endeavor as each other or the present invention.

As the inventions of each of the respective references are in unrelated classes, the Applicants respectfully disagree with the Examiner's contention that, "It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use sore one or more sets of patches as taught by Crampton in the system of Harding because Crampton provides Harding an improved system which is most efficient in the quest to reduce the time and cost of generating a computer model from a real-world object by means of scanning with both time and cost reductions of an order of magnitude achieved over conventional techniques." ***5-1-07 OA, Pg. 4.***

With regards to Claim 3, the Examiner stated, "Harding is silent about the specific details regarding the non-contact measurement system of claim 2 wherein said transformation estimator is configured to compare patches…" The Examiner then stated, "In the same field of endeavor, however, Crampton discloses scanning apparatus and method comprises transformation estimator is configured to compare patches associated with said object reference model with corresponding patches associated with said at least one image of said object to register said at least one image of said object with said object reference model [pages 9-10, paragraph (0136)]."

Paragraph [0136] of Crampton does not actually disclose a transformation estimator. Nor does paragraph [0136] disclose a comparison of patches. In fact, paragraph [0136] only discloses "…a patchwork of a number of adjoining images of different densities," and makes no note of a transformation estimator.

Crampton provides only a transformation used to "To calculate the six degrees of freedom… between the arm coordinate system and the probe coordinate system…" ***Crampton, ¶[0106].*** In addition to using the term "transformation" in a drastically different way from that of the Applicants' Application, the term "estimator" does not occur a single time in the Crampton reference. Thus, the Applicants respectfully submit that a transformation estimator, such as the one claimed in Claim 3 of Applicants' Application is not disclosed in Crampton.

With respect to Claim 4, the Examiner stated, "Regarding claim 4 Harding discloses the non-contact measurement system of claim 1 further comprising a filter module coupled to said

image register for filtering (column 3, lines 42-50) a registered scanned image (column 3, lines 23-27) and removing noise (column 5, lines 2-6). ***5-1-07 OA, Pg. 5.***

Regarding the assertion of the Examiner that Harding discloses a filter module coupled to said image register for filtering, Harding actually states, "...the structured light projected onto the surface of the object from light emitter 22 is polarized with a polarizing filter 26..." ***Harding, Col. 3, Ln. 43-45.*** As such, it is clear that the light projected in Harding is polarized by a polarizing filter prior to the light contacting the object. In stark contrast to the filter of Harding, the present invention as claimed in Claim 4 includes instead "...a filter module coupled to said image register for filtering a registered scanned image and removing noise."

The Applicants respectfully submit that in order to have formed an image of an object, the light from the light emitter must have first struck the object. Harding discloses filtering light prior to the light striking the object, and the present invention teaches filtering the image formed after light has struck the object. It is inherent that an image may only be formed by light striking an object and reflecting therefrom. The Applicants respectfully submit that Harding does not disclose the system of Claim 4.

With respect to Claim 6, the Examiner stated:

> **Regarding claim 6, Harding is silent about the specific details regarding the method of Claim 5, for providing non-contact gauge measurements of an object wherein the step of registering said image with said reference model data includes performing, at least once, the steps of:**
>
> **(a) comparing a plurality of patches of said reference model data with a plurality of associated patches of said image to identify pose data for said image; and,**
>
> **(b) adjusting the pose of said image response to said identified pose data.**

5-1-07 OA, Pg. 5. The Examiner then again asserted that Crampton and Harding are in the same field of endeavor and stated:

> **In the same field of endeavor, however, Crampton discloses scanning apparatus and method comprising the steps of:**
>
> **(a) comparing a plurality of patches of said reference model data with a plurality of associated patches of said images to identify pose data for said image [paragraph (0136)]; and**
>
> **(b) adjusting the pose of said image response to said identified pose data [paragraphs (0023) and (0148)].**

5-1-07 OA, Pg. 5. It is unclear what the Examiner intended, as ¶[0136] of Crampton discloses that, "A number of range images that are positioned in the object coordinate system must be defined." ***Crampton, ¶[0136].*** Crampton then goes on therein to define the numbers of bytes required to store the various positional data. Crampton does not disclose in ¶[0136] a comparison of patches.

Also, it is unclear as to what the Examiner intended in making reference to ¶[0023] of Crampton, as that paragraph states:

> **Where a CNC scanning machine is used, the intermediate data structures are usually range images. A number of unregistered range images may be registered, polygonized, and integrated together. The raw data is a number of range images of an object--typically from 5 to 20 in number--with each one either being a cylindrical or a linear range image. The process is not automatic and requires a combination of operator guidance and automated execution of algorithms. The operator first tries to align (i.e., register) the range images to each other on the computer using a graphics display. This process is not accurate and is followed by an automatic least squares fitting process that attempts to adjust the position and orientation of each range image such that they fit together as well as possible. This process is lengthy, often taking hours on a powerful computer. Each range image is then independently polygonized into a network of 2.5D**

> **triangular polygons. Finally, the networks of triangular polygons are integrated. The output is a single 3D polygon data set. The process is expensive, both in terms of capital equipment cost and people time. It can take up to two years to become skilled enough to scan objects to produce good enough models. It can work and produce good results for detailed objects.**

Crampton, ¶[0023]. The Applicants respectfully submit that the paragraph above, cited by the Examiner, does not disclose adjusting the pose of image response to identified pose data, but rather, discloses a process of compiling a number of images of a single object into a single, coherent image of the object.

Similarly, ¶[0148], cited by the Examiner does not disclose adjusting the pose of image response to identified pose data, but rather focuses upon the correlation of a color associated with an object to corresponding areas of a model of an object:

> **If color has been recorded for a polygon then the color information can be mapped onto the polygon. The precise mapping algorithm depends on the format of the raw color information, which depends on the design of the probe. The raw color information may comprise point, line, or area samples. The raw color information may be adjusted before mapping using calorimetric calibration and intensity calibration data. During the mapping process, the color information may be adjusted for the probe to polygon distance at point of color capture and polygon orientation to probe at point of capture. The basis for the adjustments is a set of calibration procedures carried out for each individual probe.**

Crampton, ¶[0148]. As Crampton fails to disclose comparing a plurality of patches of said reference model data with a plurality of associated patches of an image to identify pose data for an image and also fails to disclose, adjust the pose of an image response to identified pose data, the Applicants respectfully submit that Crampton does not disclose the steps of Claim 6 of Applicants' Application. Accordingly, the Applicants further submit that because Crampton fails to disclose steps of Claim 6 of Applicants' Application, the combination of Crampton and Harding

suggested by the Examiner would not produce a system having the same features as the system claimed in Claim 6 of Applicants' Application.

With respect to Claim 7, the Examiner stated:

> **Regarding claim 7, Harding discloses a non-contact measurement system for providing gauge measurements of an object, comprising:**
>
> **at least one light source adapted to illuminate said object (column 4, lines 6-12);**
>
> **at least one imaging device for obtaining a scanned image of said illuminated object (fig. 1, element 20, and column 3, lines 9-17);**
>
> **a memory configured to store data representative of a reference model of said object and data representative of at least one scanned image of said object obtained by said at least one imaging device;**
>
> **at least one software module configured to manipulate said scanned image to increase a signal-to-noise ratio (column 4, lines 50-54)**

5-1-07 OA, Pg. 6. It is unclear as to how Harding discloses a software module configured to manipulate a scanned image to increase a signal-to-noise ratio. Harding does not include a single occurrence of any of the terms "manipulate", "signal", or "ratio".

With respect to Claim 7, the Examiner also stated, "However, **Harding is silent** about the specific details regarding the steps of:...**at least one software module configured to manipulate said scanned image to increase a signal-to-noise ratio**;..." ***5-1-07 OA, Pg. 7.***

In rejecting Claim 6 above, the Examiner explicitly stated, "...**Harding discloses** a non-contact measurement system for providing gauge measurements of an object, comprising:...**at least one software module configured to manipulate said scanned image to increase a signal-to-noise ratio**..." ***5-1-07 OA, Pg. 6.*** The position of the Examiner with respect to these two Claims is contradictory. The Applicants respectfully request clarification as to how Harding first discloses features of an invention, only to be "silent" about those same features later.

In rejecting Claim 7, the Examiner further stated:

In the same field of endeavor, however, Crampton discloses scanning apparatus and method comprising the steps of:
at least one software module [page 3, paragraph (0024)] configured to manipulate said scanned image to increase a signal-to-noise ratio [page 5, paragraph (0090)];…

5-1-07 OA, Pg. 7. Paragraph [0090] of Crampton is directed to the types and controls for lamps included in the invention disclosed therein. Contrary to the assertion of the Examiner that Crampton discloses, "at least one software module [page 3, paragraph (0024)] configured to manipulate said scanned image to increase a signal-to-noise ratio [page 5, paragraph (0090)];…" ***5-1-07 OA, Pg. 7.***, paragraph [0090] of Crampton actually discloses lamp control as a means of increasing the signal-to-noise ratio: "During the process of 3D capture, the lamps are switched off where this will also have the added advantage of increasing the signal to noise ratio. " ***Crampton, ¶[0090].***

As Claim 7 of Applicants' Application includes "at least one software module configured to manipulate said scanned image to increase a signal-to-noise ratio…", the Applicants respectfully submit that the combination of the Harding and Crampton references suggested by the Examiner fails to anticipate an element of Claim 7 of Applicants' Application.

With respect to the rejection of Claim 8, the Examiner stated, "Claim 8 is similarly analyzed as Claim 6 above." ***5-1-07 OA, Pg. 8.***

With respect to Claim 6, the Examiner stated:

Regarding claim 6, Harding is silent about the specific details regarding the method of Claim 5, for providing non-contact gauge measurements of an object wherein the step of registering said image with said reference model data includes performing, at least once, the steps of:
(a) comparing a plurality of patches of said reference model data with a plurality of associated patches of said image to identify pose data for said image; and,

(b) adjusting the pose of said image response to said identified pose data.

5-1-07 OA, Pg. 5. The Examiner then again asserted that Crampton and Harding are in the same field of endeavor and stated:

> **In the same field of endeavor, however, Crampton discloses scanning apparatus and method comprising the steps of:**
>
> **(a) comparing a plurality of patches of said reference model data with a plurality of associated patches of said images to identify pose data for said image [paragraph (0136)]; and**
>
> **(b) adjusting the pose of said image response to said identified pose data [paragraphs (0023) and (0148)].**

5-1-07 OA, Pg. 5. It is unclear what the Examiner intended, as ¶[0136] of Crampton discloses that, "A number of range images that are positioned in the object coordinate system must be defined." ***Crampton, ¶[0136].*** Crampton then defines the numbers of bytes required to store the various positional data. Crampton does not disclose in ¶[0136] a comparison of patches.

Also, it is unclear as to what the Examiner intended in making reference to ¶[0023] of Crampton, as that paragraph states:

> **Where a CNC scanning machine is used, the intermediate data structures are usually range images. A number of unregistered range images may be registered, polygonized, and integrated together. The raw data is a number of range images of an object--typically from 5 to 20 in number--with each one either being a cylindrical or a linear range image. The process is not automatic and requires a combination of operator guidance and automated execution of algorithms. The operator first tries to align (i.e., register) the range images to each other on the computer using a graphics display. This process is not accurate and is followed by an automatic least squares fitting process that attempts to adjust the position and orientation of each range image such that they fit together as well as possible. This**

> **process is lengthy, often taking hours on a powerful computer. Each range image is then independently polygonized into a network of 2.5D triangular polygons. Finally, the networks of triangular polygons are integrated. The output is a single 3D polygon data set. The process is expensive, both in terms of capital equipment cost and people time. It can take up to two years to become skilled enough to scan objects to produce good enough models. It can work and produce good results for detailed objects.**

Crampton, ¶[0023]. The Applicants respectfully submit that the paragraph above, cited by the Examiner, does not disclose adjusting the pose of image response to identified pose data, but rather, discloses a process of compiling a number of images of a single object into a single, coherent image of the object.

Similarly, ¶[0148], cited by the Examiner does not disclose adjusting the pose of image response to identified pose data, but rather focuses upon the correlation of a color associated with an object to corresponding areas of a model of an object:

> **If color has been recorded for a polygon then the color information can be mapped onto the polygon. The precise mapping algorithm depends on the format of the raw color information, which depends on the design of the probe. The raw color information may comprise point, line, or area samples. The raw color information may be adjusted before mapping using calorimetric calibration and intensity calibration data. During the mapping process, the color information may be adjusted for the probe to polygon distance at point of color capture and polygon orientation to probe at point of capture. The basis for the adjustments is a set of calibration procedures carried out for each individual probe.**

Crampton, ¶[0148]. As Crampton fails to disclose comparing a plurality of patches of said reference model data with a plurality of associated patches of an image to identify pose data for an image and also fails to disclose, adjust the pose of an image response to identified pose data, the Applicants respectfully submit that Crampton does not disclose the steps of Claim 8 of

Applicants' Application. Accordingly, the Applicants further submit that because Crampton fails to disclose steps of Claim 8 of Applicants' Application, the combination of Crampton and Harding suggested by the Examiner would not produce a system having the same features as the system claimed in Claim 8 of Applicants' Application.

With respect to Claim 11, the Examiner stated:

> **Regarding Claim 11, Harding is silent about the specific details regarding the non-contact measurement system of claim 7... In the same field of endeavor, however, Crampton discloses scanning apparatus and method comprising the steps of:...at least one software module [page 3, paragraph (0024)] configured to register said scanned image with said reference model data is further configured to incorporate said at least one backlight illuminated image into registration processing [paragraphs (0023), 0095) and (0181)].**

5-1-07 OA, Pg. 9. As noted previously herein, ¶[0023] is not directed to registering a scanned image with reference data, but rather to an aggregation of a plurality of images to form a single, coherent image. ¶[0095] is directed to the formation of a lookup table allowing a system to conserve memory and time when reproducing color images. ¶[0181] discloses information pertaining to the calibration of probes. It is unclear as to what the Examiner intended, as Crampton does not disclose the features of the present invention as claimed in Claim 11, and particularly does not disclose the features noted by the Examiner, as discussed *supra*.

The Examiner stated that, "It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use first object orientation and to incorporate said at least one backlight illuminated image into registration processing as taught by Crampton in the system of Harding..." ***5-1-07 OA, Pg. 9.***

The Applicants respectfully submit that it would not have been obvious to combine the Crampton and Harding references, as the two references are in non-analogous art to the present invention, and further, that the references combined would not produce the present invention, as each of the references fails to include features of the present invention, as noted above.

With respect to Claim 12, the Examiner stated, "Claim 12 is similarly analyzed as claim 11 above." ***5-1-07 OA, Pg. 9***

With respect to Claim 11, the Examiner stated:

> **Regarding Claim 11, Harding is silent about the specific details regarding the non-contact measurement system of claim 7... In the same field of endeavor, however, Crampton discloses scanning apparatus and method comprising the steps of:...at least one software module [page 3, paragraph (0024)] configured to register said scanned image with said reference model data is further configured to incorporate said at least one backlight illuminated image into registration processing [paragraphs (0023), 0095) and (0181)].**

5-1-07 OA, Pg. 9. As noted previously herein, ¶[0023] is not directed to registering a scanned image with reference data, but rather to an aggregation of a plurality of images to form a single, coherent image. ¶[0095] is directed to the formation of a lookup table allowing a system to conserve memory and time when reproducing color images. ¶[0181] discloses information pertaining to the calibration of probes. It is unclear as to what the Examiner intended, as Crampton does not disclose the features of the present invention as claimed in Claim 12, and particularly does not disclose the features noted by the Examiner as discussed *supra*.

The Examiner stated that, "It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use first object orientation and to incorporate said at least one backlight illuminated image into registration processing as taught by Crampton in the system of Harding..." ***5-1-07 OA, Pg. 9.***

The Applicants respectfully submit that it would not have been obvious to combine the Crampton and Harding references, as the two references are in non-analogous art to the present invention, and further, that the references combined would not produce the present invention, as each of the references fails to include features of the present invention, as noted above.

In §5 of the 5-1-07 OA, the Examiner rejected Claims 9 and 10 under 35 USC 103(a) as being unpatentable over Harding and Crampton as applied to claim 8 above, and further in view of Vlahos. ***5-1-07 OA, Pg. 10.*** *(citations omitted)*

In forming the rejection, the Examiner stated, "Regarding claim 9, Harding and Crampton are silent about the specific details regarding the non-contact measurement system of claim 8…" The Examiner then states, "In the same field of endeavor, however, Vlahos discloses automatic foreground lighting effects a composited scene comprises one software module configured to manipulate said scanned image to increase a signal-to-noise ratio is further configured to generate a composite image from each of said two or more images acquired at different illumination levels (column 1, lines 42-46)." ***5-1-07 OA, Pg. 10.***

Vlahos discloses, "This invention automatically alters the apparent illumination level of the subject by varying the subjects RGB levels in a composite image when the subject appears to visit various areas in the background scene that have different illumination levels." ***Vlahos, Col. 1, Ln. 42-46.*** *(emphasis added)*

Claim 9 of the Applicants' Application is directed to:

> **The non-contact measurement system of Claim 8 for providing gauge measurement of an object wherein said at least one software module configured to manipulate said scanned image to increase a signal-to-noise ratio is further configured to generate a composite image from each of said two or more images acquired at different illumination levels.**

Applicants' Application, Claim 9. The Applicants respectfully submit that Vlahos does not produce a composite image from each of two or more images acquired at different illumination levels, as does the present invention. Vlahos instead alters the apparent illumination level of the subject by varying the subjects RGB levels. As such, the Applicants respectfully submit that Vlahos does not teach, disclose, or suggest generating a composite image, but rather focuses on manipulating the color levels of a single image.

The Applicants further respectfully submit that it would not have been obvious to combine Vlahos with the Harding and Crampton references because Vlahos is not in the same field of endeavor as the present invention, as asserted by the Examiner in the 5-1-07 OA. Vlahos is classified as belonging to US class 315/292, entitled "ELECTRIC LAMP AND DISCHARGE DEVICES: SYSTEMS/ Keyboard operated or pattern controlled regulator" As noted previously herein, the present invention is classified as belonging to US class 382/106. The Applicants respectfully submit that there would be no motivation to combine Vlahos with the Harding and Crampton references, as each is classified differently and in a different field of endeavor from that of the present invention.

With respect to Claim 10, the Examiner stated, "Regarding claim 10, Harding discloses the non-contact measurement system of claim 9, wherein said composite image comprises pixels representative of scaled values of light intensity with a predetermined light intensity range. (column 1, lines 15-21 and column 3, lines 53-63)."

The Applicants respectfully disagree with the contention of the Examiner, and respectfully direct the Examiner's attention to column 1, lines 15-21 and column 3, lines 53-63 of Harding, presented *ad seriatim*:

> **object having a complex three dimensional surface such as an airfoil (e.g. compressor blade) is a tedious and time consuming process. Airfoils, including forged blades such as those used on aircraft engines, electrical power generators, and the like, are inspected for deformations which may include, but are not limited to, skew, twist, scaling, and translation. More specifically, airfoils are inspected for**
>
> **tating identification of differences between the object and an ideal model or representation of the object.**
>
> **In this manner, even if the second polarizing lens 28 does not completely block unwanted light reflections from imaging sensor 24, the effects of these reflections can be analyzed within the image and incorrect information sorted from correct information for use in the surface inspection of the object.**

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results are obtained. As various changes could be made in

Claim 10 of the Applicants' Application recites, "The non-contact measurement system of Claim 9 wherein said composite image comprises pixels representative of scaled values of light intensity within a predetermined light intensity range."

The Applicants respectfully request clarification as to upon what grounds the rejection of Claim 10 is founded. The citation provided with the rejection as stated in the 5-1-07 OA does not correspond with the grounds for rejection stated by Examiner therein, nor does the citation relate to Claim 10 of Applicants' Application in any discernable fashion.

With respect to Claim 13, the Examiner stated, "Claim 13 under 35 U.S.C. 103(a) as being unpatentable Harding et al. (U.S. 6,678,057 B2) and Crampton (U.S. 2003/0231793 A1) as applied to claim 7 above, and further in view of Tu et al. (U. S. 6,876,459 B2)." ***5-1-07 OA, Pg. 11.***

In forming the rejection of Claim 13, the Examiner stated:

Regarding Claim 13, Harding and Crampton are silent about the specific details regarding the non-contact measurement of claim 7... In the same field of endeavor, however, Tu discloses method an apparatus for optical measurement of the leading edge position of airfoil automatic foreground lighting comprises one software module configured to process said scanned image to facilitate identification of edges of said object further configured to identify said linear highlight in said scanned image (column 1, lines 22-26).

5-1-07 OA, Pg. 11-12. Column 1, lines 22-26 of Tu discloses:

In this setup, structured light from the sensor replaces the laser stripe typically used with a positional light source. This results in a linear

highlight (the thin strip H) extending the length of the airfoil at its leading edge.

Tu, Col. 1, Ln. 22-26. Claim 13 of the present invention includes, "...at least one software module configured to process said scanned image to facilitate identification of edges of said object further configured to identify said linear highlight in said scanned image." ***Applicants' Application, Claim 13.***

Tu is directed to a light used to illuminate the length of an airfoil at its leading edge. Tu does not disclose a software module configured to process a scanned image to facilitate identification of edges of an object and further configured to identify a linear highlight in a scanned image, as does the present invention.

Accordingly, the Applicants respectfully submit that the combination of the Tu and Harding references suggested by the Examiner does not anticipate the present invention. As Tu is specifically lacking an element of Claim 13 of Applicants' Application, the combination of references does not produce each of the features of the present invention.

Therefore, Applicants respectfully submit that claims 1-4 and 6-13 are allowable and request that the rejections under 35 USC §103 (a) be withdrawn.

In view of the foregoing amendment and for the reasons set out above, Applicants respectfully submit that the application is in condition for allowance. Favorable reconsideration and prompt allowance of the application are respectfully requested.

Should the Examiner believe that anything further is needed to place the application in condition for allowance, the Examiner is requested to contact Applicants' undersigned representative at the telephone number below.

Respectfully submitted,

/Tanya L. Garrett/
Reg. No.47,588

General Electric Company
Building K1, Room 3A62
Niskayuna, New York 12309

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Telephone: (518) 387-5115 or
(518) 387-7122